National Institute of Environmental Health Sciences

Estimating the mortality effect of the July 2006 California heat wave

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Abstract:

OBJECTIVE: As a result of the California heat wave in July 2006, county coroners reported that the high temperatures during that period caused approximately 147 deaths. However, heat wave-related deaths are likely to be underreported due to a lack of a clear case definition and the multi-factorial nature of heat-related mortality. Public health policy suggests a need for a careful assessment of mortality following a heat wave. In addition, it is useful to provide a comparison of the mortality impact per degree change during heat waves versus high temperatures observed during non-heat wave periods. DESIGN: Daily data were collected for mortality, weather and ozone in seven California counties impacted by the July 2006 heat wave. The association between apparent temperature and daily mortality was assessed using a Poisson regression model and combined across counties in a meta-analysis. These results were then used to estimate the increases in the number of deaths during the heat wave. RESULTS: Our analysis indicated that during the July heat wave, there was a 9% (95% CI Euro Surveillance (Bulletin Europeen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 1.6, 16.3) increase in daily mortality per 10 degrees Fahrenheit (F) change in apparent temperature for all counties combined. This estimate is almost 3 times larger than the effect estimated for the full warm season of May-September, during the non-heat wave years. Our estimates also determined that actual mortality during the July 2006 heat wave was 2-3 times greater than the coroner estimates. CONCLUSION: This multi-county analysis provides additional evidence that the attributable risk of mortality following a heat wave may be underestimated by examining only direct heat-related deaths. In addition, we have found that the mortality effect per degrees F is several times higher than that reported during non-heat wave periods.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Air Pollution, Meteorological Factors, Temperature, Other Exposure

Air Pollution: Ozone

Temperature: Extreme Heat

Other Exposure: apparent temperature

Geographic Feature:

resource focuses on specific type of geography

Urban

Geographic Location: ☑

resource focuses on specific location

United States

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Morbidity/Mortality

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified